

PRESENT CONDITIONS

WATER QUALITY

Water quality in the rivers surrounding Sherman Island is variable depending on the water year type and flow conditions (Table 6). Salinity concentrations are lowest (79-140 ppm) during normal years with high flow conditions. Concentrations are highest (390-3,084 ppm) during critical years with high and low flow conditions. Typically, salinity concentrations are highest in July and August, regardless of year type. In below normal and dry years, salinity may increase dramatically as early as May.

Tolerance of native plants to salt concentrations varies by species, as indicated by data from Gray Lodge Wildlife Management Area (WMA) and Suisun Marsh (Table 7). Maximum salt concentrations in the Sacramento and San Joaquin rivers are higher than those found at Gray Lodge WMA but are lower than those in Suisun Marsh. Therefore if water quality in the San Joaquin and Sacramento rivers does not degrade below present conditions, soil salt concentrations should have few if any limitations on the native plants that will be grown on Sherman Island.

WATER USE

Estimates of current water diversions on Sherman Island vary from 16,908 acre-feet in a wet year to 23,026 acre-feet in a critical year (Appendix B, Table B1). These estimates are based on DWR's land use and crop ET (evapotranspiration) values and are provided here as a rough approximation of applied water and drainage values. Actual estimates may vary depending on cropping patterns and precipitation. Estimates of annual water diversions include both water actively diverted from the channel through siphons and water

Table 6. D-1485 water quality standards for agriculture at Emmaton (Sacramento River) and Jersey Point (San Joaquin River) in various year types.^a

Location	Year type	0.45 EC ^b (mmhos/cm) required from 1 April to date shown	EC (mmhos/cm) from date shown to 15 August (ppm)
Emmaton	Wet	15 August	
	Above normal	1 July	0.63 (352)
	Below normal	20 June	1.14 (637)
	Dry	15 June	1.67 (934)
	Critical	No standard	2.78 (1554)
Jersey Point	Wet	15 August	
	Above normal	15 August	
	Below normal	20 July	0.74 (392)
	Dry	15 June	1.35 (716)
	Critical	No standard	2.20 (1166)

^aTaken from Association of State Water Project Agencies. Sacramento-San Joaquin Delta: a summary of facts. September 1979.

^b0.45 EC is equal to 251 ppm.

Table 7. Soil salinities in dominant stands of various wetland plants at Gray Lodge Wildlife Management Area (WMA) and Suisun Marsh.

Species	Range of soil salinity in dominant stands (ppm)	
	Gray Lodge WMA ^a	Suisun Marsh ^b
Sago pondweed		0-9,500
Spikerush	256-2,176	
Sprangletop	320-3,520	
Smartweed	384-1,024	
Hardstem bulrush	384-1,984	2,000-22,000
Alkali bulrush	384-2,944	6,900-32,500
Swamp timothy	448-3,200	
Watergrass	512-1,920	
Cattail	512-2,304	8,100-25,500
Olney bulrush		8,500-20,700
Brass buttons		8,900-30,500
Saltgrass		11,600-43,500
Fathen		12,800-49,200
Baltic rush		16,200-23,600
Pickleweed		18,500-81,000

^aTaken from Hinz, D. 1980.

^bTaken from Mall, R. E. 1969.

passively entering the island as seepage. Diversions are highest from June to August and lowest from December to March.

The volume of water returned to the river channels ranges from 4,100 acre-feet in a below normal year to 6,964 acre-feet in an above normal year (Appendix C, Table C1). However, channel returns in a wet year are much higher (13,604 ac-ft). During the annual cycle, channel returns are highest from January through March and again in July. Returns are lowest in November and December.

Current consumptive water use on the island is estimated to be 27,391 acre-feet, based on evapotranspiration rates of the agricultural crops grown on the island (Table 8). Rainfall provides an additional 1.66 acre-feet/acre, and thus more than makes up the difference between consumptive water use and diversions.

Table 8. Base soil salinity^a, adjacent water channel salinity, and worst case scenario for soil salinity following irrigation on Sherman Island.^b

Location on island	Base soil salinity (ppm)	Adjacent channel water salinity (ppm)	worst case soil water following irrigation (ppm)
East side	1920-2560	104-672	2024-3232
South side	2560-3200	117-995	2677-4195
North side	2560-3200	92-1700	2652-4900
West side	3070-4350	118-2883	3188-7223

^aTaken from CH2M Hill Inc. 1976. Salinity study of Suisun Bay/Delta. Prepared for U.S. Army Corps of Engineers, San Francisco District.

Schoonover, W.E. 1974. A study of Delta water quality in relation to Delta agriculture. Prepared for Department of Water Resources.

^bAssuming soil water salinity and channel water salinity are additive.

Table 9. Variations in acres of 7 irrigated crops on Sherman Island, 1924 to 1984.

Crop	1924	1931	1938	1948	1955	1976	1984
Asparagus	4,000	7,652	4,068	570	0	309	744
Grain and hay	0	506	3,800	6,423	5,333	3,872	2,781
Beets	1,000	120	609	100	548	135	61
Corn	500	145	350	2,115	1,952	3,313	3,911
Tomatoes	0	0	0	0	1,026	0	0
Pasture	0	20	115	150	270	279	328
Alfalfa	300	352	0	90	274	623	703
Total irrigated	5,800	8,795	8,942	9,448	9,403	8,731	8,528
Total agriculture	5,950	8,812	8,979	9,507	9,895	9,798	9,793

The estimated diversions of water necessary for wildlife management on Sherman Island in the Wetland Management Plan are provided in Appendix D.

VEGETATION

AGRICULTURAL HISTORY

Historical cropping patterns dating to 1924 are available for Sherman Island. Total acreage in production has been relatively constant (approximately 9,700 ac) since the late 1940's (Table 9). Asparagus was the dominant crop on the island until the early 1940's, with as high as 7,652 acres in production. Grain and hay crops dominated island agriculture until the mid-1970's with 6,423 acres in production in 1948. Since the mid-1970's, corn has been the major crop on the island; in 1984, 3,911 acres were planted to this crop. Additionally, minor acreages of sugar beets, tomatoes and alfalfa have been planted on the island.

CROPPING PATTERNS

Cropping patterns on Sherman Island remain relatively static, and crop rotation systems to replenish the soil with essential nutrients are not normally practiced. Currently 9,463 acres (99%) of the island are utilized for agricultural production; corn (3,911 ac) and grain and hay (2,781 ac) are the dominant crops (Table 9). The remainder of the agricultural land is planted to safflower (812 ac), asparagus (744 ac), alfalfa (703 ac), pasture (328 ac), grain sorghum or milo (108 ac), sugar beets (61 ac) and miscellaneous truck crops (15 ac). Fallow lands represent an additional 174 acres.

The majority of these crops are planted in late fall and winter (November-March). The only exceptions are corn and milo, which are planted in April. Asparagus, also planted in April, is a labor intensive crop and once established is not taken out of production for approximately 10 years. Barley is planted in January, sugar beets in February and safflower in March. Alfalfa is normally seeded in November following the first rains, while wheat is planted during either November or December depending upon field conditions.

Harvesting occurs primarily during summer and early fall. Wheat and barley are harvested in June or July, whereas safflower, sorghum and corn are normally harvested in September or October. In some years, double cropping occurs on some lands. Usually corn or milo are planted following the harvest of wheat or barley. The harvest of sugar beets tends to be controlled by the processor but normally occurs in October or November on Sherman Island. Asparagus is cut from March through June. The first cutting of alfalfa occurs in early April with successive cuttings at 4-week intervals.

NATIVE VEGETATION

A list of 63 plant species was compiled during surveys of the island conducted between mid-August and early November (Table 10). Additional species undoubtedly occur during different periods of the year but they were not evident during the survey. Of those species identified, the majority were annual plants located adjacent to field borders, roadsides, irrigation and drainage canals and the exterior levee of the island. Collectively, these areas constitute the majority of the 438 acres of native vegetation on the island.

Giant reed, common reed, dill, wild radish and various grasses dominated the vegetation on the exterior levee. Along roadsides and the edges of drier fields, common sow thistle, bindweed, Johnson grass, bermuda grass and yellow star thistle predominated while in moister areas barnyard grass, California blackberry, knotgrass, smartweed and yellow nutgrass were common. Bulrush, cattails, duckweed, pondweed and yellow waterweed were present in Mayberry Slough Lake as well as in irrigation and drainage ditches. In fallow fields, species such as bindweed, cocklebur, nightshade and pigweed were abundant.

Only 9 species of woody vegetation were identified on the island (Table 10). The majority occur as small groups of trees along the exterior levee and some ditches. Eucalyptus, cottonwood and willow are most common. A small dense stand of willows is present adjacent to the boat ramp in the southwest corner of the island. In addition, pine and cedar trees have been established in the residential area and near some farmsteads.

Two species listed as "rare" plants in California may also exist on Sherman Island, although they were not identified during the survey. Previous sightings of Mason's lilaeopsis were reported in 1953, 1955 and 1978. Two of these sightings occurred on the channel-side of the exterior levee. Although not previously documented on the island, personnel in the Natural Heritage Division of CDFG also indicated that suitable habitat for the CDFG "Candidate" species California hibiscus exists on the water-side of the exterior levee. The development described herein will not impact rare or candidate species, as all occur on the channel-side of the levee.